

1. A method for unloading a cargo from a vehicle, the method comprising:

providing a vehicle defining a longitudinal direction substantially parallel to the direction of travel thereof, a vertical direction substantially parallel to the normal direction of gravitational forces, and a lateral direction substantially perpendicular to both the vertical and longitudinal directions during straight travel on a flat surface, the vehicle comprising a frame supporting loads in at least the vertical direction and a door selectively engageable with the frame to restrain cargo against removal;

engaging the door with the frame to provide the combination thereof with a stiffness substantially greater than that of the frame and door when disengaged;

loading the vehicle with cargo;

externally supporting the frame;

disengaging the door from the frame; and

unloading the cargo.

2. The method of claim 1, wherein the cargo has a weight substantially greater than the bearing capacity of the frame disengaged from the door.

3. The method of claim 2, wherein the frame comprises an upper frame member and a lower frame member, the door having an upper edge hingedly attached to the upper frame member and a lower edge selectively engaged with the lower frame member to stiffen the combined frame and door.

4. The method of claim 3, wherein externally supporting the frame includes exerting a vertically upward force on the lower frame member.

5. The method of claim 4, wherein engaging the door with the frame further comprises translating the door vertically upward to move the lower edge thereof into engagement with the lower frame member

5 6. The method of claim 5, wherein unloading the cargo comprises rotating the vehicle in a plane of motion defined by substantially the vertical and lateral directions.

7. The method of claim 6, wherein the vehicle has a proximal end and a distal end spaced apart in the longitudinal direction, the vehicle further comprising:

10 a front wheel assembly and a rear wheel assembly, each positioned beneath the lower frame member, and spaced apart from one another;

a front support positioned proximate the front wheel assembly to selectively engage the door to exert an upward force thereon;

15 a rear support positioned proximate the rear wheel assembly to selectively engage the door to exert an upward force thereon.

8. The method of claim 7, wherein engaging the frame with the door further comprises engaging, by the door, the front and rear supports.

5 9. The method of claim 8, further comprising providing a bearing surface to support the vehicle thereon, and wherein unloading the cargo further comprises anchoring the vehicle to the bearing surface in substantially fixed relation.

10 10. The method of claim 9, wherein rotating the vehicle further comprises rotating the bearing surface relative to a base supporting the bearing surface and fixed with respect to the earth.

11. An apparatus for transporting and unloading cargo, the apparatus comprising:
a vehicle defining a longitudinal direction parallel to the direction of travel of the
vehicle, a vertical direction substantially parallel to the direction of gravitational forces, and
a lateral direction perpendicular to both the vertical and longitudinal directions, the vehicle
comprising:

a frame supporting loads in at least the vertical direction,
a door selectively engaging the frame to restrain a cargo against exiting, and
a securement structure fixing the door and frame with respect to one another
to substantially increase mechanical stiffness thereof when engaged; and
a platform comprising:

a bearing member for supporting the vehicle,
a base resting on a support surface, and
a platform actuator secured to the bearing member and the base to selectively
rotate the bearing member and vehicle relative to the base to unload the cargo upon
disengagement of the door from the frame.

12. The apparatus of claim 11, wherein the frame comprises an upper support
member and a lower support member, the door having an upper edge hingedly secured to the
upper support member and a lower edge selectively engaging the lower support member to
restrain cargo against removal

13. The apparatus of claim 12, wherein the door further comprises a catch secured
proximate the lower edge, and wherein the lower support member further comprises a
receptacle positioned to selectively receive the catch to fix the door with respect to the frame.

14. The apparatus of claim 13, wherein the receptacle is open below such that upward movement is required to engage the catch with the receptacle.

5 15. The apparatus of claim 14, wherein the bearing member further comprises an external support selectively engaging the frame to reduce stresses therein.

16. The apparatus of claim 15, wherein the external support engages and supports the lower support member.

10 17. The apparatus of claim 16, further comprising a door actuator engaging the frame and the door to move the door into and out of engagement with the frame.

18. The apparatus of claim 17, wherein the bearing member further comprises an anchor selectively securing the vehicle to the bearing member.

19. The apparatus of claim 18, wherein the vehicle has a proximal end and a distal end spaced apart in the longitudinal direction, the vehicle further comprising:

a front wheel assembly and a rear wheel assembly each positioned beneath the lower frame member and spaced apart from one another;

5 a front support positioned proximate the proximal end to selectively engage the door to exert an upward force thereon; and

a rear support positioned proximate the distal end to selectively engage the door to exert an upward force thereon.

10 20. The apparatus of claim 18, wherein the external support further comprises an agitator connected to oscillate the vehicle and aid unloading of cargo.

15 21. The apparatus of claim 19, wherein the external support further comprises an insulator disposed to substantially insulate the portion of the bearing member remote from the external support from vibration.

22. The apparatus of claim 20, further comprising a second vehicle storing cargo and a third vehicle towing the first and second vehicles, the first, second, and third vehicles disposed in a B-train configuration.

23. An apparatus for transporting and unloading cargo, the apparatus comprising:
a vehicle having a longitudinal direction corresponding to a direction of travel thereof, with a vertical direction and lateral direction, all substantially mutually orthogonal;

the vehicle comprising a frame supporting loads in at least the vertical direction and having an upper member, lower member spaced therefrom, and a floor supported by the lower member;

the vehicle further comprising a door pivotally suspended proximate the upper member and selectively engageable proximate the lower member to restrain cargo against removal in a lateral direction;

the vehicle further comprising a latching system to selectively engage the lower member with the door to increase the strength and stiffness thereof sufficiently to support the cargo, when engaged, and leaving the lower member and floor insufficiently strong and stiff to support the cargo when not engaged; and

a platform comprising a bearing member to support the vehicle thereon, a base supported by a support surface, and an actuator secured to the bearing member and a base to selectively rotate the bearing member and vehicle about a longitudinal axis relative to the base to unload the cargo laterally when the door is open.

24. The apparatus of claim 23, wherein the platform further comprises a support pad selectively positionable between the bearing member and the lower member to support the lower member and floor during unloading operations with the door and lower member disengaged.

25. The apparatus of claim 24, wherein the door further comprises a lower edge and a catch proximate thereto, and wherein the lower member further comprises a receptacle positioned to selectively receive the catch to engage the door and lower member.

5 26. The apparatus of claim 25, wherein the receptacle is open below to receive the catch and engage the door upon upward translation of the receptacle.

27. The apparatus of claim 23, further comprising a door actuator engaging the frame and the door to move the door into and out of engagement with the frame.

10 28. The apparatus of claim 23, wherein the platform further comprises an anchor selectively and substantially fixedly securing the vehicle to the bearing member.

29. The apparatus of claim 23, further comprising:

15 a front wheel assembly and a rear wheel assembly positioned beneath the lower member and spaced apart from one another;

 a front support proximate the front wheel assembly, selectively engaging the door to exert an upward force thereon; and

 a rear support proximate the rear wheel assembly selectively engaging the door to
20 exert an upward force thereon.

30. The apparatus of claim 23, wherein the platform further comprises:

a support member extendable from the bearing member to support the frame and cargo during unloading upon disengagement of the door and lower member;

an agitator connected to oscillate the vehicle in aid of discharging cargo therefrom;

and

an insulator disposed to substantially insulate the bearing member from vibration by the agitator.